

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Previously presented) A fine fiber filter media comprising a single layer of filter substrate, the substrate having a first surface and a second surface, the substrate having a permeability of about 0.03 to 15 m-sec⁻¹ and an efficiency greater than 10%, the first surface and the second surface each comprising a layer of fine fiber having a diameter of about 0.001 to 0.5 microns, the layer of fine fiber having a thickness of less than 5 microns, the layer of fine fiber formed in an amount effective to obtain a pore size of about 0.0001 to 5 microns, an overall efficiency under ASTM-1215-89 with monodisperse 0.78 micron polystyrene latex particles at 20 l/min velocity of about 50% to 90% in any one layer and to obtain an efficiency of greater than 90% in the layers combined.

2. (Previously presented) The filter media of claim 1 wherein the efficiency of the substrate is greater than 20% and the efficiency of the fine fiber layer on the first surface is different than the efficiency of the fine fiber layer on the second surface.

3. (Previously presented) The filter media of claim 1 wherein the efficiency of the substrate is greater than 20% and the efficiency of the fine fiber layer on a downstream surface is greater than the efficiency of the fine fiber layer on an upstream surface.

4. (Canceled)

5. (Original) The filter media of claim 1 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of less than 85% and in both layers combined to obtain an overall efficiency of greater than 90% and the substrate has an efficiency of about [[5%]] 10% to about 80%.

6. (Original) The filter media of claim 1 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of less than 80% and in both layers combined to obtain an overall efficiency of greater than 85% and the substrate has an efficiency of about 20% to about 80%.

7. (Original) The filter media of claim 1 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 85% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about ~~[[5%]]~~ 10% to about 80%.

8. (Original) The filter media of claim 1 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 80% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about 20% to about 80%.

9. (Original) The filter media of ~~claim 4~~ claim 1 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an overall efficiency of less than 75% and in both layers combined to obtain an efficiency of greater than 80%, and retains greater than 30% of the fiber unchanged for filtration purposes.

10. (Previously presented) The filter media of claim 1 wherein the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns; wherein the filter media has an efficiency greater than the efficiency of a single sided media and has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H₂O at test conditions of 10 ft/min.

11. (Previously presented) A method of removing a particulate from an air borne stream, the particulate comprising a liquid particulate, a solid particulate or mixtures thereof, the method comprises:

- (a) placing a filter structure in an air stream having a particulate; and
- (b) directing the air stream through the filter structure while monitoring the useful life of the filter structure; said filter structure comprising a fine fiber filter media and single layer of a filter substrate the substrate having a permeability of about 0.03 to 15 m-sec⁻¹ and an efficiency of greater than 10%, the substrate having a first surface and a second surface, the first surface and the second surface each comprising a layer of fine fiber having a diameter of about 0.001 to 0.5 microns, the layer of fine fiber having a thickness of less than 5 microns, the fine fiber layer formed in an amount effective to obtain a pore size of about 0.001 to 5 microns, an efficiency under ASTM-1215-89 with monodisperse 0.78 micron polystyrene latex particles at 20 ft/min velocity of about 50% to 90% in any one layer and to obtain an efficiency of greater than 90% in the layers combined.

12. (Previously presented) The method of claim 11 wherein the efficiency of the substrate is greater than 20% and the efficiency of the fine fiber layer on the first surface is different than the efficiency of the fine fiber layer on the second surface.

13. (Previously presented) The method of claim 11 wherein the efficiency of the substrate is greater than 20% and the efficiency of the fine fiber layer on a downstream surface is greater than the efficiency of the fine fiber layer on an upstream surface.

14. (Canceled)

15. (Original) The method of claim 11 wherein the fine fiber layer formed in an amount effective to obtain an efficiency of less than 85% in any one layer and to obtain an efficiency of greater than 90% in both layers combined.

16. (Original) The method of claim 11 wherein the fine fiber layer formed in an amount effective to obtain an efficiency of less than 80% in any one layer and to obtain an efficiency of greater than 85% in both layers combined.

17. (Previously presented) The method of claim 11 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 85% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about ~~[[5%]]~~ 10% to about 80%.

18. (Original) The method of claim 11 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 80% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about 20% to about 80%.

19. (Original) The method of claim 11 wherein the fine fiber layer formed in an amount effective to obtain an efficiency of less than 75% in any one layer and to obtain an efficiency of greater than 80% in both layers combined.

20. (Original) The method of claim 11 wherein the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns; wherein the filter media has an efficiency greater than the efficiency of a single sided media and has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H₂O at test conditions of 10 ft/min.

21. (Canceled)

22. (Original) The method of ~~claim 21~~ claim 11 wherein the particulate comprises residual components of combustion.

23. (Original) The method of ~~claim 21~~ claim 11 wherein the particulate comprises a fatty oil, a fatty acid or mixtures thereof.

24. (Original) The method of ~~claim 24~~ claim 11 wherein the particulate comprises soot, a grit or mixtures thereof.

25. (Previously presented) A filter structure consisting essentially of one layer of filter substrate and three or more layers of fine fiber, the substrate layer having a first surface and a second surface, the substrate having a permeability of about 0.03 to 15 m-sec⁻¹ and an efficiency of greater than 5%, the surfaces comprising three or more layers of the fine fiber on the substrate, each fine fiber layer comprising fine fiber having a diameter of about 0.01 to 0.5 micron, each fine fiber layer having a thickness of less than 5 microns, the fine fiber layer formed in the amount effective to obtain a pore size of about 0.0001 to 5 microns, an efficiency under ASTM 1215-89 with monodisperse 0.78 micron polystyrene latex particles at 20 ft/min velocity of about 50% to 90% in any one layer and to obtain an overall efficiency of greater than 90% in the layers combined.

26. (Previously presented) The filter media of claim 25 wherein the efficiency of the substrate is greater than 20% and the efficiency of one fine fiber layer in the filter structure is different than the efficiency of any other fine fiber layer in the filter structure.

27. (Previously presented) The filter media of claim 25 wherein the efficiency of the substrate is greater than 20% and the efficiency of a fine fiber layer on a downstream surface is greater than the efficiency of a fine fiber layer on an upstream surface.

28. (Canceled)

29. The filter media of claim 25 wherein the sheet-like filter substrate has a thickness of about 0.3 to 1 millimeters.

30. (Previously presented) The filter media of claim 25 wherein each fine fiber layer is formed in an amount effective to obtain an efficiency of less than 85% and in all layers combined to obtain an overall efficiency of greater than 90%.

31. (Previously presented) The filter media of claim 25 wherein each fine fiber layer is formed in an amount effective to obtain an efficiency of less than 80% and in all layers combined to obtain an overall efficiency of greater than 85%.

32. (Previously presented) The filter media of claim 25 wherein each fine fiber layer is formed in an amount effective to obtain an efficiency of about 40% to 85% and in all layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about 5% to about 80%.

33. (Previously presented) The filter media of claim 25 wherein each fine fiber layer is formed in an amount effective to obtain an efficiency of about 40% to 80% and in all layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about 20% to about 80%.

34. (Previously presented) The filter media of claim 25 wherein each fine fiber layer is formed in an amount effective to obtain an overall efficiency of less than 75% and in all layers combined to obtain an efficiency of greater than 80%, and retains greater than 30% of the fiber unchanged for filtration purposes.

35. (Previously presented) The filter media of claim 25 wherein the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns; wherein the filter media has an efficiency greater than the efficiency of a single sided media and has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H₂O at test conditions of 10 ft/min.

36. (Previously presented) A fine fiber filter media consisting essentially of a single layer of filter substrate, the substrate having a first surface and a second surface, the substrate having a permeability of about 0.03 to 15 m-sec⁻¹ and an efficiency greater than 20%, the first surface and the second surface each comprising a layer of fine fiber having a diameter of about 0.001 to 0.5 microns, the layer of fine fiber having a thickness of less than 5 microns, the layer of fine fiber formed in an amount effective to obtain a pore size of about 0.0001 to 5 microns, an overall efficiency under ASTM-1215-89 with monodisperse 0.78 micron polystyrene latex particles at 20 ft/min velocity of about 50% to 90% in any one layer and to obtain an efficiency of greater than 90% in the layers combined.

37. (Previously presented) The filter media of claim 36 wherein the efficiency of the fine fiber layer on the first surface is different than the efficiency of the fine fiber layer on the second surface.

38. (Previously presented) The filter media of claim 36 wherein the efficiency of the fine fiber layer on a downstream surface is greater than the efficiency of the fine fiber layer on an upstream surface.

39. (Previously presented) The filter media of claim 36 wherein the sheet-like filter substrate has a thickness of about 0.1 to 3 millimeters, the first surface and the second surface each comprising a layer of fine fiber having a diameter of about 0.01 to 0.3 microns the layer having a thickness of less than 3 microns, the fine fiber selected such that after test exposure for a test period of 16 hours to test conditions of 140°F air and a relative humidity of 100% retains greater than 50% of the fiber unchanged for filtration purposes.

40. (Previously presented) The filter media of claim 36 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of less than 85% and in both layers combined to obtain an overall efficiency of greater than 90% and the substrate has an efficiency of about ~~[[5%]]~~ 10% to about 80%.

41. (Previously presented) The filter media of claim 36 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of less than 80% and in both layers combined to obtain an overall efficiency of greater than 85% and the substrate has an efficiency of about 20% to about 80%.

42. (Previously presented) The filter media of claim 36 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 85% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about ~~[[5%]]~~ 10% to about 80%.

43. (Previously presented) The filter media of claim 36 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an efficiency of about 40% to 80% and in both layers combined to obtain an overall efficiency of greater than 65% and the substrate has an efficiency of about 20% to about 80%.

44. (Previously presented) The filter media of claim 40 wherein the fine fiber layer formed in an amount effective, in each layer, to obtain an overall efficiency of less than 75% and in both layers combined to obtain an efficiency of greater than 80%, and retains greater than 30% of the fiber unchanged for filtration purposes.

45. (Previously presented) The filter media of claim 36 wherein the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns; wherein the filter media has an efficiency greater than the efficiency of a single sided media and has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H₂O at test conditions of 10 ft/min.